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First low latitudes reconstruction of the dust polarization spectral energy distribution variation

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The search for primordial gravitational waves signals imprinted in the Cosmic Microwave Background (CMB) polarization B-modes signal motivates the development of a new generation of high sensitive experiments (e.g. CMB-S4, LiteBIRD), which would be able to trace a signal several orders of magnitude lower than the one in total intensity. However, insidious instrumental and foreground systematic effects could bias this detection and therefore need to be carefully addressed. Among those, the knowledge of foreground emissions appears to be crucial. In particular the galactic dust polarized emission spectral dependence, not yet fully characterized, could leave a high level of uncertainty in the cosmological polarization data and falsify the CMB B-modes detection.

The characterization of the dust spectral energy distribution (SED) variations detected in intensity in the Planck-HFI data show that it will probably be the most critical issue in the quest of primordial B-modes.

In this work we present a cross correlation analysis, performed by using the last Scroll2 release of Planck polarization data, showing evidence of a dust SED variation at low galactic latitudes. The dependence of this variation by possibly different effects will be discussed.

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